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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,954	08/19/2008	Bruno Francois Pouet	17174/002001	1482

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EXAMINER	
CONNOLLY, PATRICK J	

ART UNIT	PAPER NUMBER
2877	

NOTIFICATION DATE	DELIVERY MODE
09/10/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/583,954	POUET, BRUNO FRANCOIS	
	Examiner	Art Unit	
	PATRICK J. CONNOLLY	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19th August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,11-13 and 17-19* is/are rejected.

7)☒ Claim(s) *4-10 and 14-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21st June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06.21.2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 and 11-13 are rejected under 35 U.S.C. 102(e) as being clearly anticipated U.S. Patent No. 7,006,231 by Ostrovsky et al ("Ostrovsky").

As to claims 1 and 11, Ostrovsky discloses a multi-channel laser interferometric method and system for measuring the displacement of a surface of a material subject to ultrasound including (see Figures 6 and 11): generating a laser beam of predetermined intensity (via source 102); dividing the laser beam into a reference beam and a probe beam having respective intensities representing minor and major fractions of the predetermined intensity (via 90/10 beamsplitter 202); passing the probe beam through an optical lens (110) to focalize the probe beam onto the surface of the material subjected to ultrasound (material 119) thereby scattering same; expanding the reference beam (via fiber exit 116); combining the scattered probe beam collected by said optical lens with the said expanded reference beam to obtain an optical fringe signal (via 50/50 beamsplitter 222); receiving said optical fringe on at least one array of photodetectors (arrays 226 and 224), wherein said optical fringe fully covers said array and each photodetector of the array and each photodetector of the array defines a channel, having a given aperture smaller than the aperture of said optical lens to receive a portion of said optical fringe

signal and converting said portion of said fringe signal into an electrical signal; processing for each channel said electrical signals through circuitry means (computer 126); summing electrically said processed signals to extract an output signal correlated to the motion of said surface (outputted via display 128; see also column 16).

As to claims 2, 3, 12 and 13, Ostrovsky discloses filtering via the parallel to serial conversion process (see column 17).

As to claims 17 and 18, Ostrovsky discloses detector arrays.

As to claims 19, Ostrovsky discloses a "fiberized" device using detector array (see Figure 6).

Allowable Subject Matter

Claims 4-10 and 14-16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claim 4, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method including: linearly polarizing the scattered probe beam collected by the optical lens, circularly polarizing the expanded reference beam; combining the linearly polarized scattered probe beam to obtain two optical fringe signals having a phase shift of 90 degrees; and receiving the first and second fringe signals on two array of detectors, the two arrays of detectors being identical, two detectors of the corresponding channels of the arrays generating two in-quadrature electrical signals, the electrical signal pairs being then processed together through circuitry means, in combination with the rest of the limitations of claim 4.

As to claim 9, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method including: wherein said scattered probe beam and said expanded reference beam having crossed polarization, it further comprises dividing each of the scattered probe beam and the expanded reference beam in two optical signals having a 180° phase difference, the combining of the optical signals resulting in four optical fringe signals having -90°, 0°, 90° and 180° relative phase differences; and wherein the step of receiving further comprises: receiving the four optical fringe signals on four arrays of detectors, the four arrays of detectors being identical, each set of four detectors of a corresponding channel generating two in-quadrature pairs of out-of- phase electrical signals, subtracting each said out-of-phase electrical signals to obtain a pair of differential in-quadrature electrical signals for each said channel, said pairs of differential in-quadrature electrical signals being processed together through said circuitry means., in combination with the rest of the limitations of claim 9.

As to claim 10, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method including: frequency shifting said reference beam, the optical fringe signal resulting from combining said scattered probe beam with said expanded shifted reference beam being an heterodyne optical fringe signal, and the step of processing comprising demodulating each electrical signal for each channel by removing the frequency shift using heterodyne demodulation techniques, in combination with the rest of the limitations of claim 10.

As to claim 14, the prior art of record, taken alone or in combination, fails to disclose or render obvious an apparatus including polarizing means for circularly polarizing the expanded reference beam including: the combining means comprise a polarizing beam splitter for combining the linearly polarized scattered probe beam with the expanded circularly polarized

reference beam to obtain two optical fringe signals having a phase shift of 90°; the receiving means comprise two identical arrays of detectors for receiving the optical fringe signals on, the two detectors of a same channel of each array generating a pair of in-quadrature electrical signals, the pairs of in-quadrature electrical signals being then processed together by the circuitry means, in combination with the rest of the limitations of claim 14.

As to claim 15, the prior art of record, taken alone or in combination, fails to disclose or render obvious an apparatus including: polarizing means for setting the polarization of the expanded reference beam orthogonal to the polarization of the probe beam; dividing means to divide each of the polarized scattered probe beam and the expanded orthogonally polarized reference beam into a first and a second signals; an optical retardation device in one of the first or second optical signals to obtain a phase shift of 90° between the first and second optical signals; and wherein: the combining means comprise two polarized beam splitters for combining the two orthogonally polarized components of the first and second optical signals, each into two optical fringe signals having a 180° phase difference; resulting in four optical fringe signals having -90°, 0°, 90° and 180° relative phase differences; the receiving means comprise four identical arrays of detectors for receiving the four optical fringe signals, each set of four detectors of a corresponding channel generating two pairs of out-of-phase electrical signals, the circuitry means further comprise subtracting means for subtracting each of the out-of-phase electrical signals to obtain a pair of differential in-quadrature electrical signals for each said channel, the pairs of differential in-quadrature electrical signals being then processed together, in combination with the rest of the limitations of claim 15.

As to claim 16, the prior art of record, taken alone or in combination, fails to disclose or render obvious a multi-channel laser heterodyne interferometric apparatus including: a frequency shifting device for frequency shifting the reference beam by a given frequency, the frequency shifted reference being then expended, and wherein: the combining means combine the scattered probe beam with the expanded frequency shifted reference beam to obtain an heterodyne optical fringe signal, the heterodyne optical fringe signal being received by the receiving means; the circuitry means comprise demodulation means for processing for each channel the heterodyne electrical signals through demodulation by removing the frequency shift using standard heterodyne demodulation techniques, the output signal obtained by summing the processed signals being proportional to the displacement of the surface, in combination with the rest of the limitations of claim 16.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK J. CONNOLLY whose telephone number is (571)272-2412. The examiner can normally be reached on 9:00 am - 7:00 pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571.272.2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Patrick J Connolly/
Primary Examiner, Art Unit 2877